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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of
BECKER et al
Serial No. 09/877,249
Filed: June 11, 2001
For: APPARATUS AND PROCESS FOR OXIDATION REACTIONS

Atty. Ref.: 608-297
TC/A.U.: 1764
Examiner: Leung, J.A.

* *

November 28, 2006

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

Applicant hereby appeals to the Board of Patent Appeals and Interferences from the last decision of the Examiner.

11/30/2006 CNGUYEN2 00000053 09877249
01 FC:1401 500.00 OP

11/30/2006 CNGUYEN2 00000056 09877249
01 FC:1402 500.00 OP

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AFS

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Sir:

☐ **Correspondence Address Indication Form Attached.**

☐ **NOTICE OF APPEAL**
Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the Examiner twice/finally rejecting applicant's claim(s). $500.00 (1401)/$250.00 (2401) $

☒ An appeal **BRIEF** is attached in the pending appeal of the above-identified application $500.00 (1402)/$250.00 (2402) $ 500.00

☐ Credit for fees paid in prior appeal without decision on merits -$ ( )

☐ A reply brief is attached. **(no fee)**

☐ Petition is hereby made to extend the current due date so as to cover the filing date of this paper and attachment(s)
One Month Extension $120.00 (1251)/$60.00 (2251)
Two Month Extensions $450.00 (1252)/$225.00 (2252)
Three Month Extensions $1020.00 (1253/$510.00 (2253)
Four Month Extensions $1590.00 (1254/$795.00 (2254) $

☐ "Small entity" statement attached.

Less month extension previously paid on -$( )

TOTAL FEE ENCLOSED $ 500.00

Any future submission requiring an extension of time is hereby stated to include a petition for such time extension. The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our **Account No. 14-1140.** A duplicate copy of this sheet is attached.

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NIXON & VANDERHYE P.C.
By Atty: Leonard C. Mitchard, Reg. No. 29,009

Signature: _____

TABLE OF CONTENTS

(I) REAL PARTY IN INTEREST

The real party in interest is BP Chemicals Limited, a corporation of the country of the United Kingdom.

(II) RELATED APPEALS AND INTERFERENCES

The appellant, the undersigned, and the assignee are not aware of any related appeals, interferences, or judicial proceedings (past or present), which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

(III) STATUS OF CLAIMS

Claims 1, 2, 5, 6, 10-16, 18-20, 47, 48, 51, 52, 54-60 and 62-64 are pending and have been rejected. No claims have been substantively allowed.

(IV) STATUS OF AMENDMENTS

While claim 47 was indicated as "currently amended", in fact no amendment was made. No amendments have been filed since the date of the Final Rejection.

(V) SUMMARY OF CLAIMED SUBJECT MATTER

In one embodiment (claim 1), the invention relates to a reactor for containing a solid catalyst for a heterogeneous gas-phase reaction, the reactor being a fluid bed reactor (page 2, line 27 onwards, and page 7, line 4). The reactor includes a grid (page 7, line 22); more than one inlet pipes for a molecular oxygen-containing gas extending into the reactor (page 3, lines 3-4); surround means for surrounding a substantial portion of the inlet pipes in the reactor with an inert gas (page 3, lines 5-6); and means for detecting a change in pressure of the inert gas surrounding the inlet pipes (page 4, lines 28-29). The surround means are provided with a supply of an inert gas (page 3, lines 26-27), and the inert gas surrounding the inlet pipes is sealed (page 4, line 24 and Figures 1 and 2, element 3).

A further embodiment (claim 47) is provided which is similar to that summarized above (claim 1), except that the surround means is provided with a limited supply of inert gas sufficient to replace minor leaks (page 4, lines 25-27).

(VI) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds of rejection are to be reviewed on appeal:

(1) Claims 1, 2, 5, 6, 10, 11, 19, 20, 47, 48, 51, 52, 54, 55, 63 and 64 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over U.S. Patent 4,374,663 to Collin et al in view of U.S. Patent 2,794,681 to Suess and U.S. Patent 4,461,743 to Chowdhury.

(2) Dependent claims 12-16 and 56-60 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Collin et al in view of Suess and Chowdhury and further in view of U.S. Patent 3,411,716 to Stephan et al.

(3) Dependent claims 18 and 62 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Collin et al in view of Suess and Chowdhury and further in view of U.S. Patent 5,801,265 to Wagner et al.

(VII) ARGUMENT

The Action alleges that the combination of Collin and Suess discloses all of the limitations of claims 1 and 47 except for the grid and the use of inert gas to surround a substantial portion of the inlet pipes. According to the Action, it would have been obvious to one of ordinary skill in the art at the time of the invention to substitute the fluidization means of Collin with a grid, and to substitute the cooling medium of Collin with an inert gas since, according to the Action, the use of grids for providing adequate fluidization of a mass of solids is well known in the art (other that the Examiner's Official Notice relating to the use of grids, no citation is provided in support of this assertion), and the use of inert gas for cooling nozzle structures is allegedly well known in the art (the Examiner cites Chowdhury as evidence of the latter). Reversal of the rejection is respectfully requested.

The combination of Collin and Suess does not disclose or suggest to one of ordinary skill that the fluid surrounding the inlet pipes should be "sealed", as specifically required by claim 1. Moreover, with regard to claim 47, the combination of Collin and Suess does not disclose or suggest to one of ordinary skill that the surround means be provided with a limited supply of inert gas sufficient to replace minor leaks, as specifically required by claim 47.

Collin discloses supplying oxygen to a fluidised bed for the reduction of iron oxide (col. 1, lines 5-17), in which nozzles for the supply of hot fluidizing gas are cooled to prevent reduced iron oxide adhering to the surface of the nozzles (col. 1, lines 61-65). Collin discloses that cooling with air is "not enough for cooling the outer surface of the nozzle to prevent the iron oxide from sticking to the nozzle" (col. 1, lines 61-64), and discloses the use of water as the coolant (col. 2, line 12). Collin further discloses that

the cooling medium continually flows through a cooling jacket, entering via an inlet and exiting via an outlet (col. 2, line 12 & col. 2, lines 62 to 68). There is no disclosure or suggestion in Collin that the cooling medium surrounding the inlet pipes should be "sealed".

Suess is directed to the problem of leakage of cooling medium supplied to nozzles, which is different to the problem addressed by Collin, namely the prevention of particles of reduced iron sticking to the nozzles. For this reason alone, Collin and Suess would not have be combined by one of ordinary skill. Even if Collin and Suess were combined (it is believed that this would not have been contemplated by one of ordinary skill), the presently claimed invention would not have resulted or have been suggested thereby. Suess describes an arrangement in which water is fed into the cooling jacket through a conduit and discharged from the cooling jacket through a further conduit (col. 1, lines 65-67 and col. 2, lines 65-68). Membranes detect a change in the amount of water supplied to and discharged from the conduits by registering a change in pressure of the water across the membranes (col. 4, lines 1-17). The amount of water is increased at the moment in which the amount discharged decreases because of leakage (col. 4, lines 20-24).

Suess therefore requires that water be supplied to the cooling jacket and then discharged therefrom in order that a pressure change may be detected. The cooling jacket of Suess is not structured such that the coolant surrounding the inlet is sealed, as required by the presently claimed invention. In fact, Suess would be rendered unsatisfactory for its intended purpose if the cooling jacket were sealed since, in a sealed system, the two membranes would register the same pressure and, if a leak occurred, the two membranes would still read the same pressure. Consequently, there

would be no detection of any pressure change of the coolant. Since Suess specifically requires that the coolant is not sealed, Suess leads away from the presently claimed invention and doe not render obvious the claimed invention when combined with Collin.

In both the Final Action and the Advisory Action, the assertion is made that "the features upon which the Applicant relies (i.e. a surround means having an inlet, but no outlet, for the inert gas supply) are not recited in the rejected claims". In reply, it is not necessary to include such limitations, since the claim specifically requires that the inert gas surrounding the inlet pipes be "sealed". There can be no outlet for the inert gas if the inert gas surrounding the inlet pipes is sealed. This is clear from the present claim language. To further recite that the surround means has no outlet for the inert gas would be repetitive and redundant.

Chowdhury is relied upon for its disclosure of other cooling media used for nozzles. While Chowdhury discloses a heat transfer resisting fluid such as nitrogen, carbon dioxide, air or water, as noted above, Collin is clear that a gas is inappropriate for solving the problem of particles sticking to a nozzle, and solves the problem by employing a liquid, typically water. Collin therefore leads away from the use of gaseous media. Moreover, Chowdhury does not relate to a gas-phase fluidized bed reactor but, instead, to an apparatus for injecting a mixture of liquid water and an oxygen-enriched gas into a gas-liquid reaction medium within a wet oxidation reactor. In addition, the problem addressed in Chowdhury (i.e. the prevention of evaporation of water in inlet pipes) is not the same as the problem addressed by Collin, i.e., the prevention of particles of reduced iron sticking to the nozzles. Thus, for all of the above reasons, there would have been no motivation for one of ordinary skill to resort to Chowdhury in the context of Collin and/or Suess. Absent any such motivation, the combination of

Collin, Suess and Chowdhury does not give rise to a *prima facie* case of obviousness as alleged by the Examiner. Reversal of the obviousness rejection based on the combined disclosures of Collin, Suess and Chowdhury is accordingly respectfully requested.

With specific regard to claim 47, the combination of Collin or Suess does not disclose or suggest that the surround means should be provided with a limited supply of inert gas sufficient to replace minor leaks, since both references disclose that a continuous supply and discharge of the coolant is required. Thus, the combination of Collin and Suess (with or without Chowdhury) leads **away** from the invention of claim 47. The obviousness rejection of claim 47 should also be reversed.

For all of the above reasons, it is clear that one of ordinary skill would not have been motivated to arrive at the presently claimed invention based on the combined disclosures of Collin, Suess and Chowdhury, particularly as there is no suggestion in those references, taken either singly or in combination, of the insert gas surrounding the inlet pipes being "sealed". Absent any such motivation, a *prima facie* case of obviousness has not been generated in this case. Reversal of the obviousness rejection based on Collin, Suess and Chowdhury is respectfully requested.

With reference to the rejection of dependent claims 12-16 and 56-60 over Collin in view of Suess and Chowdhury and further in view of Stephan et al., and the rejection of dependent claims 18 and 62 over Collin in view of Suess and Chowdhury and further in view of Wagner et al., it is believed those rejections should also be reversed for the same reasons as urged above in connection with the rejection over Collin, Suess and Chowdhury. Stephan and Wagner fail to cure the above-discussed deficiencies of

Collin, Suess and Chowdhury and, as such, do not give rise to a *prima facie* case of obviousness. Reversal of those rejections is respectfully requested.

CONCLUSION

In conclusion it is believed that the application is in condition for allowance. Early reversal of the Final Rejection and passage of the subject application to issue are earnestly solicited.

Respectfully submitted,

NIXON & VANDERHYE P.C.

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(VIII) CLAIMS APPENDIX

1. A reactor for containing a solid catalyst for a heterogeneous gas-phase reaction said reactor being a fluid bed reactor comprising:

a grid;

more than one inlet pipes for a molecular oxygen-containing gas extending into said reactor;

surround means for surrounding a substantial portion of said inlet pipes in said reactor with an inert gas; and

means for detecting a change in pressure of said inert gas surrounding said inlet pipes;

wherein the surround means are provided with a supply of an inert gas, and further wherein the inert gas surrounding the inlet pipes is sealed.

2. A reactor as claimed in claim 1 in which at least 85% of said pipes in said reactor are surrounded by said surround means.

3-4 (cancelled).

5. A reactor as claimed in claim 1 in which said surround means comprises one or more outer pipes surrounding a substantial portion of said inlet pipes for molecular oxygen containing gas in said reactor .

6. A reactor as claimed in claim 5 which further comprises means for allowing for differential expansion of said inlet pipes and said surround means.

7-9. (canceled)

10. A reactor as claimed in claim 1 in which each of said inlet pipes further has means for suppressing ingress to the inlet pipe from the reactor of flame, reagents, products, catalyst or combinations thereof.

11. A reactor as claimed in claim 10 in which said ingress suppression means comprises means for providing molecular oxygen-containing gas in said inlet pipe at a higher pressure than the pressure in said reactor.

12. A reactor as claimed in claim 10 in which said ingress suppression means comprises a restriction to the outlet of said inlet pipe.

13. A reactor as claimed in claim 12 in which said restriction comprises one or more orifices.

14. A reactor as claimed in claim 12 in which said restriction is located at a distance from the outlet of said inlet pipe in the reactor such that a potential detonation is avoided.

15. A reactor as claimed in claim 12 in which said restriction is located 4 to 5 pipe diameters from the end of the inlet pipe.

16. A reactor as claimed in claim 12 in which said restriction is located within a region of said inlet pipe surrounded by said surround means.

17. (cancelled)

18. A reactor as claimed in claim 1 in which the distance between inlet pipes is significantly in excess of potential flame length.

19. A reactor as claimed in claim 1 in which said molecular oxygen-containing gas for said inlet pipes is provided from a common end box having an inventory.

20. A reactor as claimed in claim 1 in which each of said inlet pipes is operably connected to a supply of molecular oxygen-containing gas provided through one or more flow restriction means which restrict the flow of molecular oxygen-containing gas to the inlet pipe.

21-46. (cancelled)

47. A reactor for containing a solid catalyst for a heterogeneous gas-phase reaction said reactor being a fluid bed reactor comprising:

a grid;

more than one inlet pipes for a molecular oxygen-containing gas extending into said reactor;

surround means for surrounding a substantial portion of said inlet pipes in said reactor with an inert gas; and

means for detecting a change in pressure of said inert gas surrounding said inlet pipes;

wherein the surround means is provided with a limited supply of inert gas sufficient to replace minor leaks.

48. A reactor as claimed in claim 47 in which at least 85% of the said pipes in said reactor is surrounded by said surround means.

49-50 (cancelled).

51. A reactor as claimed in claim 47 in which said surround means comprises one or more outer pipes surrounding a substantial portion of said inlet pipes for molecular oxygen containing gas in said reactor.

52. A reactor as claimed in claim 51 which further comprises means for allowing for differential expansion of said inlet pipes and said surround means.

53. (canceled)

54. A reactor as claimed in claim 47 in which each of said inlet pipes further has means for suppressing ingress to the inlet pipe from the reactor of flame, reagents, products, catalyst or combinations thereof.

55. A reactor as claimed in claim 54 in which said ingress suppression means comprises means for providing molecular oxygen-containing gas in said inlet pipe at a higher pressure than the pressure in said reactor.

56. A reactor as claimed in claim 54 in which said ingress suppression means comprises a restriction to the outlet of said inlet pipe.

57. A reactor as claimed in claim 56 in which said restriction comprises one or more orifices.

58. A reactor as claimed in claim 56 in which said restriction is located at a distance from the outlet of said inlet pipe in the reactor such that a potential detonation is avoided.

59. A reactor as claimed in claim 56 in which said restriction is located 4 to 5 pipe diameters from the end of the inlet pipe.

60. A reactor as claimed in claim 56 in which said restriction is located within the region of said inlet pipe surrounded by said surround means.

61. (cancelled)

62. A reactor as claimed in claim 47 in which the distance between inlets is significantly in excess of the potential flame length.

63. A reactor as claimed in claim 47 in which said molecular oxygen-containing gas for said inlet pipes is provided from a common end box having an inventory.

64. A reactor as claimed in claim 47 in which each of said inlet pipes is operably connected to a supply of molecular oxygen-containing gas provided through one or more flow restriction means which restrict the flow of molecular oxygen-containing gas to the inlet pipe.

65. (cancelled)

(IX) EVIDENCE APPENDIX

None

(X) RELATED PROCEEDINGS APPENDIX

None